

PATENT

Attorney Docket No. A-71184/DJB/VEJ
Application No. 09/980,956**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Cancelled)
2. (Currently Amended) A planar fuel cell stack gas separator member according to claim ~~125~~ wherein the layer of copper or copper-based alloy of the gas separator member has a thickness in the range of from about 0.1mm to about 4mm.
3. (Currently Amended) A planar fuel cell stack gas separator member according to claim 2 wherein the layer of copper of the gas separator member has a thickness in the range of from about 0.1mm to about 1mm, ~~preferably about 0.25mm to about 1mm, more preferably from about 0.4mm to about 0.7mm.~~
4. (Currently Amended) A planar fuel cell stack gas separator member according to claim ~~125~~ wherein the copper-based alloy of the gas separator member comprises copper alloyed with up to a maximum of 50 wt%, ~~preferably up to a maximum of about 20%wt,~~ of one or more alloying elements selected from the group consisting of Al, Ni, Zn, Sn, Fe, Be, Ag, Au, Mn, Si, P, and Pb.
5. (Currently Amended) A planar fuel cell stack gas separator member according to claim ~~125~~ wherein the layer of oxidation resistant material of the gas separator member has a thickness in the range of about 50 to about 1000 microns, ~~preferably up to 200 microns, preferably up to 100 microns.~~
6. (Currently Amended) A planar fuel cell stack gas separator member according to claim ~~125~~ wherein the layer of oxidation resistant material on the gas separator member is

CORRECTED LISTING OF CLAIMS

- 2 -

PATENT

Attorney Docket No. A-71184/DJB/VBJ
Application No. 09/980,956

selected from the group consisting of a foil attached to the layer of copper or copper-based alloy, a coating on the layer of copper or copper-based alloy and a substrate onto which the layer of copper or copper-based alloy is coated.

7. (Currently Amended) A planar fuel cell stack gas separator member according to claim 6 wherein the layer of oxidation-resistant material on the gas separator member is a foil or a substrate and comprises a heat resistant steel.
8. (Currently Amended) A planar fuel cell stack gas separator member according to claim 7 wherein the heat resistant steel is coated with alumina on the cathode side of the gas separator member.
9. (Currently Amended) A planar fuel cell stack gas separator member according to claim 7 wherein the heat resistant steel contains at least 4 wt% aluminium and forms a surface layer of alumina on the gas separator member at least at the operating temperature of the fuel cell stack.
10. (Currently Amended) A planar fuel cell stack gas separator member according to claim 6 wherein the layer of copper or copper-based alloy of the gas separator member is coated with plural layers on the cathode side which together form the layer of oxidation-resistant material.
11. (Currently Amended) A planar fuel cell stack gas separator member according to claim 6 wherein the oxidation resistant material of the gas separator member comprises Al_2O_3 applied to the layer of copper or copper-based alloy as an alumina coating.
12. (Currently Amended) A planar fuel cell stack gas separator member according to claim 6 wherein the oxidation resistant material of the gas separator member comprises Al_2O_3

PATENT

Attorney Docket No. A-71184/DJB/VEJ
Application No. 09/980,956

applied to the layer of copper or copper-based alloy as an aluminum coating which is subsequently oxidised.

13. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim 12 wherein the aluminium coating is at least partly diffused into a cathode-side surface portion of the layer of copper or copper-based alloy prior to being oxidised.
14. (Cancelled)
15. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim ~~1425~~ wherein the protective layer of the gas separator member is of heat resistant steel which ~~may optionally be coated with alumina on the anode side or contain at least 4wt% aluminum so as to form a surface layer of alumina at least at the operating temperature of the fuel cell.~~
16. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim 15 wherein the heat resistant steel of the protective layer of the gas separator member is in the form of a foil.
17. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim ~~1425~~ wherein the protective layer of the gas separator member comprises Al_2O_3 applied to the layer of copper or copper-based alloy as an alumina coating.
18. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim ~~1425~~ wherein the protective layer of the gas separator member comprises Al_2O_3 applied to the layer of copper or copper-based alloy as an aluminium coating which is subsequently oxidised.

PATENT

Attorney Docket No. A-71184/DJB/VEJ
Application No. 09/980,956

19. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim 18 wherein the aluminium coating is at least partly diffused into an anode-side surface portion of the layer of copper or copper-based alloy of the gas separator member prior to being oxidised.
20. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim 1425 wherein the protective layer of the gas separator member is made up of plural layers, namely a metal barrier layer applied to the layer of copper or copper-based alloy and formed of a material selected from the group consisting of W, Ta, Nb and an alloy of one or more of said metals which does not dissolve into the layer of copper or copper-based alloy, an intermediate layer of Ag on the metal barrier layer, and a barrier layer on the intermediate layer formed of a metal selected from the group consisting of Ni, a noble metal except Ag and an alloy of one or more of Ni and noble metals except Ag.
21. (Cancelled)
22. (Currently Amended) A planar fuel cell stack ~~gas separator member~~ according to claim 2129 wherein the aluminium bronze of the gas separator member contains at least 5 wt% Al.
23. (Currently Amended) A planar fuel cell stack according to claim 29 wherein the gas separator member ~~according to claim 21~~ having has a thickness in the range of from about 1mm to about 4mm, ~~preferably to about 2mm.~~
24. (Cancelled)
25. (Currently Amended) A planar fuel cell stack including at least two planar solid oxide fuel cells each having a layer of solid oxide electrolyte, an anode layer on one side of the electrolyte layer and a cathode layer on the other side of the electrolyte layer, and a

CORRECTED LISTING OF CLAIMS

- 5 -

PATENT

Attorney Docket No. A-71184/DJB/VEI
Application No. 09/980,956

respective gas separator member between the at least two fuel cells, wherein the ~~or each~~
gas separator member ~~is in accordance with any of the preceding claims.~~ has an anode
side and a cathode side and comprises a layer of copper or of copper-based alloy
containing at least 50 wt% Cu, a layer of oxidation-resistant material on the cathode side
of the copper or copper-based alloy layer and a protective layer on the anode side of the
copper or copper-based alloy layer to prevent Cu vapor escaping from the anode side of
the gas separator member at the operating temperature of the stack.

26. (New) A planar fuel cell stack according to claim 4 wherein the copper is alloyed with up to a maximum of about 20 wt % of said one or more alloying elements.
27. (New) A planar fuel cell stack according to claim 15 wherein the heat resistant steel of the protective layer of the gas separator member has a surface layer of alumina on the anode side of the gas separator member.
28. (New) A planar fuel cell stack according to claim 27 wherein the heat resistant steel of the protective layer of the gas separator member contains at least 4 wt% aluminum.
29. (New) A planar fuel cell stack including at least two planar solid oxide fuel cells each having a layer of solid oxide electrolyte, an anodic layer on one side of the electrolyte layer and a cathode layer on the other side of the electrolyte layer, and a gas separator member between the at least two fuel cells, wherein the gas separator member has an anode side and a cathode side and comprises a layer of aluminum bronze, a layer of alumina on the cathode side of the layer of aluminum bronze to provide oxidation resistance and a protective layer of alumina on the anode side of the layer of aluminum bronze to prevent Cu vapor escaping from the anode side of the gas separator member at the operating temperature of the stack.